

DETAILED ACTION

Status

1. Claims 8-20 are pending and presented for examination. Claims 11 and 20 have been amended.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 8, 10-12, 14-15 and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Cope et al. (US 3429486).

In regard to claim 8, Cope teaches a tar impregnated fused silica stopper head. The stopper head comprises vitreous silica that is impregnated with tar, a carbonaceous material. The article taught by Cope would be capable of guiding or conveying a solidified material, for example the article could be used as a roller (figure 2).

In regard to claims 10-12, the article taught by Cope contains at least 85% amorphous silica, up to 3% magnesium oxide (column 2, lines 1-3), up to 5% of a plasticizer (column 1, lines 61-63), 4% water (column 2, lines 48-49) and is impregnated with tar (column 2, lines 62-63).

In regard to claims 14 and 15, Cope teaches the method of forming the refractory article by firing a batch comprising vitreous silica and water, heating tar to 400°F and then immersing the articles in the hot tar (column 2, lines 64-65).

In regard to claims 17 and 18, Cope teaches that after the impregnation of the refractory with the tar, the composite material is then baked to cokify the tar (column 2, lines 57-59).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1793

7. Claims 9, 13, 16 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cope.

In regard to claim 9 and 20, while Cope does not teach that the refractory material contains 1-6 % of carbonaceous material, it would have been obvious to one skilled in the art at the time of the invention that this would be an expected amount of infiltration of a fired fused silica article based upon the method employed by Cope. The required tar content would be an obvious and expected result of the process taught by Cope.

In regard to claim 13, it would have been obvious to one skilled in the art at the time of the invention to produce a refractory article of the type taught by Cope with more than 90% amorphous silica. This would have been achieved in the course of routine optimization of the material. Such a modification is suggested by the teaching of Cope that at least 85% amorphous silica is required, thereby suggesting that higher silica contents would be more desirable.

In regard to claim 16, while Cope does not teach the impregnation of the article under pressure, it would have been obvious to one skilled in the art to utilize elevated pressure to improve the efficiency of the impregnation step taught by Cope. Such a modification would have been obvious to one skilled in the art as it is well known in the art that elevated pressure aids infiltration processes.

In regard to claim 19, it would have been obvious to one skilled in the art at the time of the invention to combine the steps of impregnating the article with tar and baking at elevated temperature as taught by Cope in to one step. Combining the steps of

impregnation and cracking would improve the efficiency of the manufacturing process taught by Cope. As was previously stated, carrying out the impregnation step at an elevated pressure would have been obvious to one skilled in the art at the time of the invention, and the combination of the impregnation and cokifying steps would therefore result in a cracking process that occurs at an elevated pressure. This modification would be the result of the optimization of the process taught by Cope.

Response to Arguments

8. Applicant's arguments, see arguments to 35 U.S.C. 112 rejection, filed 3/13/2008, with respect to the rejection of 18 have been fully considered and are persuasive. The rejection of claim 18 has been withdrawn.

The arguments correctly point out that a proper written description of the claimed method step is contained within the specification.

9. Applicant's arguments filed 3/13/2008 to the rejection of claims 8-20 under U.S.C. 102 and 103 have been fully considered but they are not persuasive.

The argument that Cope is not capable of guiding or conveying a solidified material is not persuasive. While the stopper head taught by Cope is intended for use with molten metals, it is not incapable of use with solid materials. For example, the nozzle stopper system taught by Cope could be used to control the flow of particulate matter, comprising fine grains. Or, the stopper head could be used as a roller to support the movement of a solid material, as the depiction of the stopper head (figure 2) clearly shows the article contains a cylindrical portion. The use of the article for the control of molten metal flow is an exemplified embodiment of the article taught by Cope,

but does not prevent the article's use to guide or convey solidified materials. Further, one skilled in the art would have reason to consult Cope when searching for a refractory article that will reduce molten tin pick-up, as the article taught by Cope is hot metal and slag resistant (column 2, lines 59-61), properties that will prevent molten metal pick-up.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **KEVIN M. JOHNSON** whose telephone number is (571)270-3584. The examiner can normally be reached on Monday-Friday 7:30 AM to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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